PTO 04-4639

CY=EU DATE=19881026 KIND=A1
PN=288 405

PROCESS FOR PREPARING AN ADDITIVE COMPOSITION FOR HUMAN FOOD PRODUCTS
[Procédé de préparation d'une composition d'addition pour produits d'alimentation humaine.]

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UNITED STATES PATENT AND TRADEMARK OFFICE
Washington, D.C. August 2004

Translated by: FLS, Inc.

PUBLICATION COUNTRY	(10): EU
DOCUMENT NUMBER	(11): 0288405
DOCUMENT KIND	(12): A1 (13): Published Application
PUBLICATION DATE	(43): 19881026
PUBLICATION DATE	(45):
APPLICATION NUMBER	(21): 884300007.0
APPLICATION DATE	(22): 19880420
ADDITION TO	(61):
INTERNATIONAL CLASSIFICATION	(51): A23L 1/313, A23B 4/00, A23L 1/01
DOMESTIC CLASSIFICATION	(52):
PRIORITY COUNTRY	(33): FR
PRIORITY NUMBER	(31): 8705729
PRIORITY DATE	(32): 19870421
INVENTOR	(72): André Combes
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TITLE	(54): PROCESS FOR PREPARING AN ADDITIVE COMPOSITION FOR HUMAN FOOD PRODUCTS
FOREIGN TITLE	(54A): Procédé de préparation d'une composition d'addition pour produits d'alimentation humaine

The present invention pertains to natural additive composition /2* for human food product, which contain, or do not contain meat products, its preparation process, and its use, especially in the canning industry, cold cuts, meat packing, and prepared meals.

It is common knowledge that meat products used in the canning industry undergo varying physical, and chemical treatments during their manufacturing according to the type of meat product (beef, chicken,...), and according to the treatments the animal underwent before slaughter, such as the type, and quality of the feed, the addition of various products to the feed (hormones, vitamins, mineral salts, etc...), the breeding method (stabling, outside, etc...). These treatments have a multiple objective; first, controlling the evolution of the meat product during its transformation, and preservation so that it keep all its edible, and taste characteristics, and finally giving, or preserving the desired characteristics to the final product such as: color, appearance, flavor, and shelf life.

The main physico-chemical treatment for meat products is salting. In addition to placing the fresh meat product in contact with sodium chloride, the industry has the habit of putting it simultaneously into contact with products other than salt. Among these products with specific roles, one can mention nitrates, which when transformed into

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*Numbers in the margin indicate pagination in the foreign text.

nitrites in the meat medium react according to the authors, with the hemoglobin to give a more or less stable attractive color to the meat product; polyphosphates, whose goal is to improve the water retention of the medium, and avoid drying; reducing sugar whose function is to modify the pH by fermentation; carbonates; lactic ferments, glutamates, acetates, alum, sulfates, gelatin, etc.

The function of these products is not always clearly explained, and empirically very complex formulations are created. About this subject, see: René PHALLU, "La charcutérie en France", volume 1 and 2, 1956, Edition R. PALLU, Paris.

A second, rather general treatment for meat products is the treatment using a phosphate, whose role is recognized as favorable for the presentation of the manufactured product.

Numerous reproaches are made about the use of some of these additives considering their action, or their toxicity for the consumer, in particular nitrate, and nitrite, to the point where legislation in the next few years will reduce, or prohibit the use of such products.

In addition, the current raw meat products have been modified during the animals' lifetime by feeding methods, and products favoring muscle development , so that the raw product varies according to the supplier, and that afterwards the treatments described above applied to these products provide an insufficient result in the final preparation, especially as for its flavor, and taste characteristics.

The industry is therefore searching for compositions susceptible of preventing the use of additive products which are dangerous for humans, preferably of natural origin, capable of improving the flavor, the color, the water retention, and the shelf life of the finished meat products, and to affect, and reinforce the action of specific additives.

In addition, generally, the human food industry is seeking additive compositions, natural in origin, with a high protein value, susceptible of improving, or modifying the taste characteristics of a preparation, and affecting the lack of proteins.

The present invention therefore pertains to an additive composition, natural in origin for human food products which contain, or do not contain meats products, its manufacturing process, and its use, especially in the canning industry, cold cuts, meat packing, and prepared meals.

By additive compositions, we mean compositions, which, when added to the human food products according to known processes, in relatively low amounts, and not considerably modifying the ponderal amounts of the major elements, restore, modify, or amplify certain characteristics of appearance, preservation, taste, or nutrition.

By composition with a natural origin, we mean a composition whose raw materials are natural, and which only undergo physical, and heat treatments outside of any addition of a chemical, or biochemical

reagent susceptible of entering into reaction with them, such as acids, bases, enzymes.

By human food product, we mean products usually absorbed orally, such as meat products, or preparations originating from them, vegetable base products, flours, starches, and their mixtures.

By meat products we mean animal products containing in particular muscle, and fat, and having undergone a more, or less advanced manual transformation, such as red, or white meat, raw, or cooked ham, sausages, fresh sausages, spreads, etc., and cooked dishes containing meat, or meat products.

The terms canning, cold cuts, meat packing, and prepared meals are themselves known, and it is not necessary to further explain them.

The invention's additive composition is obtained by physical treatment of a raw animal product containing muscle pieces, cartilage pieces, bone pieces, and animal fat pieces to which one usually adds pieces of organ meat. The muscle, cartilage, bone, and fat pieces consist usually of the "low quality" pieces which are generally little, or poorly used by the meat trade, and the pieces of organ /3 meat usually including the liver, the spleen, the kidneys, the lungs, etc.

The ponderal ratios of these muscle pieces, cartilage pieces, bone pieces, and animal fat pieces are usually those of the "low quality" pieces, and it varies in function of the type, and the kind of animal used (beef, mutton, pork, etc.), but also the method of

processing the carcasses (manual, or mechanical), the operators' skill, and the ability of the consumer market to absorb more, or less of the less noble pieces. However, it is essential that there is a non negligible amount of muscle, cartilage, bone, and fat pieces; the best ponderal ratios are the ones that one usually finds on a carcass once the noble pieces are removed, without however it being possible to define these ratios very precisely.

Of course, it is possible to mix low quality pieces from animals of different types or species. It is also possible to enrich the initial mixture with one of its parts if there is a lack.

As an example, a butchering facility (pork, beef, mutton) supplies for 100 kgs of meat slaughtered (excepting the organ meat):

67 kgs of muscle meat

22 kgs of bone et aponeurosis (cartilage)

11 kg of fat

Out of the 67 kgs of muscle meat, globally according to the type of meat packing, 13 to 20 kgs are low quality.

The ponderal ratio between the "low quality", and the organ meat is not critical, and it varies in function of the constitution of initial animals. However, it is preferred that the weight of organ meat to the weight of low quality meat does not exceed that usually contained in the carcass, and it is generally situated between 0.1 and 5%,

The physical treatment according to the invention includes heat treatment operations, and purification, then concentration operations.

The heat treatment includes heating the raw material in a closed autoclave in an aqueous medium. The aqueous medium preferably includes sodium chloride, in addition to water, in order to improve the preservation of the produce, but it is not indispensable in the process. A ponderal ratio of sodium chloride to the solid material used of between 0.1 and 4% is preferred, preferably close to 2.5% of the animal weight.

The ponderal ratio of the raw material to the water is not critical; however, it will be the highest possible compatible with the device, and the proper progress of the operation. Usually it is preferred that the ratio be in the range of 4.

The temperature interval used goes from 80°C to 130°C, and one proceeds by successive stages of temperature within the interval defined; of course, the internal pressure of the autoclave varies in function of the temperature.

The processing time for the temperatures defined above is usually situated between 8, and 20 hours, preferably between 12, and 15 hours, without this interval being restrictive, however, it is preferable that the processing time done between 80°C and 110°C represents about two thirds of the total time of the operation, the time kept at the maximal temperature being the shortest possible.

The temperature is brought back to 30°C by cooling, and the pressure of the autoclave is lowered.

At the end of the processing, the liquid juice is separated with the solid, and the juice is decanted, preferably while cool, to provide an underlying colored aqueous phase, and a solid supernatant phase, mainly consisting of fats. The aqueous phase is removed then filtered, or centrifuged while cool, to obtain the invention's composition.

The product is generally concentrated by moderate boiling, if necessary in a vacuum, in order to make a paste; or it can be conditioned in the solid state in the form of powder, by means of atomization, or flash drying.

Analysis of the dry extract paste product situated between 60%, and 70% provide the following results expressed in dry weight.

1. Bacteriological verification

- Negative at the time of the product's preparation.

- Samples of paste products with 70% dry extract prepared in the presence of sodium chloride (2.5% in weight of the solid weight put into the autoclave) were poured into test tubes, and left open in a butcher's atmosphere whose temperature varies in function of the seasons between 5°C, and 30°C for 2 years without any development of bacteria or mold.

2. Ponderal and chemical analyses (product prepared in the presence of 2.5% in weight of sodium chloride.

- Ash content 10% to 16%
- Protein content 35% to 50%
- Calcium 0 to 4mg/100mg
- Phosphorus 40 to 80 mg/100mg
- Fats 0.2 to 2.5%

3. Physical characteristics

Product more or less pasty, or viscous, brown color, pronounced meat odor, varying in function of the initial raw material, water soluble in any proportion at room temperature, soluble in any proportion in an aqueous solution of 2% sodium chloride.

The powder obtained by atomization has a beige color.

The composition according to the invention is used as an additive product in human food compositions, in particular, it /4 is well suited as an additive for meat products undergoing transformation.

It is used alone, or mixed with other conventional additive products of the canning industry, cold cuts, meat packing, and prepared meals, such as condiments, spices, flavor products, preservatives, coloring, agents designed to regulate the bacterial, or enzymatic activity, etc. Used alone in a meat based preparation, the invention's composition generally enables improving the taste, and the flavor of the preparations, an improvement of the ponderal yield (defined as the ratio of the weight of meat product obtained after preparation to the weight of the initial raw meat), and a better

behavior of the entirety as it is in particular the case in preparing raw, or cooked ham.

Used in prepared meals without meat products (vegetable, starches) the composition give the desired meat product flavor, and allows adding proteins in particular.

The invention will be illustrated by the following non restrictive examples, the parts being expressed in weight.

Example 1: Preparing the invention's additive composition based on various meats.

Carcasses of beef, pork, and mutton, once the noble pieces removed, provide 50 parts of low quality pieces, bones, aponeurosis, and fats for 100 initial parts.

500 kg of this mixture, plus 25 kgs of various organ meat, are placed into an autoclave of a capacity of 800 liters equipped with a double shell. Then add 10 kgs of salt, and 125 liters of water; close the autoclave, and bring the temperature to 80°C in one hour. Maintain this temperature for 5 hours, then bring it to 110°C in one hour, and maintain it at 110°C for three hours. Then bring it to 120°C in one hour, and maintain it two hours at 120°C. Then cool to 50°C in two others, and release the pressure. Remove the liquid, and send it to decantation tanks; decant in a cold room at +3°C for 24 hours. The fat solid mass which floats is wasted, and the brown liquid remaining is concentrated at 105°C at atmospheric pressure

until a 65% dry extract is obtained. The yield is 7% of product at 65% dry extract for the weight of solid matter used.

Analysis of the product in % dry

- Protein 40.3%
- Lipids 0.2%
- Calcium 3.7 mg/100g
- Phosphorus 40 mg/100g
- Ash content 15.9%

Example 2. Use of the composition in curing raw ham

Prepare the following pumping pickle solution for 100 liters of water:

- Saltpeter 0.600 kgs
- Sugar 0.700 kgs
- Dextrose 0.300 kgs
- Salt 20.000 kgs
- Condiments 0.100 kgs

A 16° BAUME concentration is obtained. This is used as the reference solution.

In addition, prepare a second solution according to the invention from the reference solution by adding 1 kg of the example concentrate for 100 liters of solution to it.

Inject high quality fresh hams with both the above solutions at a rate of 20% in weight of solution injected, using a needle injection device.

Place the hams in cooking pouches, and cook in a vacuum at 68°C for 9 hours.

At the ham taste testing, the flavor, and taste of the ham treated with the solution according to the invention are greatly reinforced, constant in the mass, its visual appearance is more attractive, its hold when cut is better, and its yield at cooking is 97% while it is 93% with the reference solution.

Preserving the hams

Place the hams treated according to the invention, and according to the reference solution in a cold room at +3°C.

At the end of a month to two months, the reference hams secrete a grayish colored mucilage, damaging the sale value of the product.

On the contrary, the hams treated according to the invention are preserved with an unchanged appearance, for the worst for six months for some samples, and at least for a year for most of the cases.

Example 3. Use of the composition for manufacturing a canned cooked meal.

In a 4/4 can, place:

- 200 g of beef
- 400 g of vegetables (beans, onions, carrots)
- 200 g of water
- salt, and spices qsp, and 5 g of the invention's composition from example 1.

In addition, a comparison test is done without the invention's composition. The cans are processed using cannery techniques. At tasting, the meat in the can treated according to the invention has a taste, and appearance very superior to that of the reference meat. Even a reference meat which was first cooked before being canned does not have the same taste characteristics.

Claims

- CLAIM 1: Process for preparing a natural composition for human food products, at least 65% in weight of dry extract, and a protein content of at least 45% in weight, characterized by the fact that the animal matter, consisting of the muscle pieces, cartilage pieces, /5 bone pieces, and animal fat pieces, is heated in an aqueous medium to a temperature situated between 80°C, and 130°C for periods situated between 8, and 20 hours, preferably between 12, and 15 hours, then it is cooled; and in that the fats are separated, and decanted; and in that it is concentrated by evaporation.

- CLAIM 2: Process according to claim No. 1, characterized by the fact that, in addition, the animal matter contains organ meat in amounts situated between 0.1, and 5% in weight of the muscle, bone, and cartilage parts.

- CLAIM 3: Process according to one of the claims characterized by the fact that an amount situated between 0.1, and 4% in weight, preferably near 2.5% of the animal matter, is heated in the presence of sodium chloride.

- CLAIM 4: Use of the composition according to one of the previous claims in the canning industry, cold cuts, meat packing, and prepared meals.